Supplements: The Search for the Magic Bullet

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Americans are surrounded by appealing advertisements for supplements, that promise the perfect physique and great health. In a survey on advertisements conducted of 12 popular bodybuilding magazines, 89 brands of nutritional supplements were advertised with 311 products containing 235 unique ingredients. They advertise the easy way out, take this pill, powder, fluid, or snack bar and you will achieve weight loss, fat loss, increased muscle mass, and good health with little to no effort. Everyone is looking for that "magic bullet", in fact, seven out of every ten Americans buy into these claims and use supplements. Supplements are on the rise and Americans are spending more money on them every year (refer to graph). But, do they work?

The New York City Department of Consumer Affairs says that 56% of supplements are "worthless and possibly harmful". How can these supplements be harmful? Doesn't the United States have strict regulations on food and drugs? This is true. However, supplements do not fall under the same regulations the food and drugs do. The Dietary Supplement and Health Education Act (DSHEA) of 1994 makes it legal to sell almost any substance regardless of its safety or effectiveness. According to DSHEA, any product may be sold as long as it is labeled as a dietary supplement. Supplement products are not subject to the strict pre-market safety testing required for drugs or new food ingredients. Instead the Food and Drug Administration (FDA) may remove a supplement product from the shelf if any ingredients within it pose "a significant or unreasonable risk of illness or injury" under normal doses. This means that the consumer is the "guiny pig". The product will be pulled of the shelf only after it has done harm to people. Under this act the supplement manufacturer is also allowed to make various claims about their product, except for claims that the product will diagnose, prevent, mitigate or cure a specific disease. Many supplement manufacturers take advantage of this with deceptive marketing techniques. Some of these techniques include:

- Taking published research out of context
- Claiming products are University tested, when no research has been done
- Using unauthorized endorsements by professional organizations
- Making false statements that research is currently underway
- Referencing research inappropriately
- Using testimonials
- Patenting products

Not only do supplement manufacturers use deceptive marketing techniques, but they also use poor manufacturing practices. The FDA is now requiring a standardized "Supplement Facts" label on all supplements. The new label looks like the standard food label and contains the following information: serving size, calories in that serving if

applicable, and a complete list of the ingredients. However this label does not insure that what the manufacturer states is in the product is actually there. For example, a product may have a label that claims there is 100 mcg of chromium in each tablet. In actuality, the tablets in that product may only have 80 mcg of chromium. Furthermore, these same tablets within the same bottle may vary in the amount of chromium they have. One tablet may have 60 mcg and another 100 mcg of chromium. The products may also suffer from impurities in the manufacturing process.

Although the DSHEA does not currently regulate manufacturing processes, it allows for the FDA to establish regulations governing the preparation, packaging and holding of supplements. The FDA has attempted to regulate these processes by requiring the new supplements label on all products. This is one step in the right direction but it still does not fully protect the consumer. The supplement market is largely "buyer beware".

What supplements work?

With so many supplements on the market and so little research it is hard to say what actually works and what doesn't. The best way to ensure health and promote fitness is to eat a variety of foods from the Food Guide Pyramid and focus on eating 5 fruits and vegetables a day. Supplements cannot take the place of a healthy diet. In addition some supplements may be unsafe and adversely effect health. However, if you choose to supplement your diet the following table may help you weed out some of the dangerous supplements and some of the supplements that may be beneficial.

Supplement	Claim	Research	Side Effects	Recommendation
Vitamins & minerals	Increase energy, improve body functions, prevent disease	FDA has set regulations for good health	Can create imbalances, can overdose	For people with poor diets or low calorie diets, pregnant women, and elderly take 100% of RDA daily
Protein	Increase muscle growth	U.S. population gets plenty of protein	Excess calories can be turned to fat	Protein supplement is usually not needed, may be useful for vegetarians
Ginko Biloba	Memory enhancement, improving circulation Antioxidant properties	Some preliminary research supports in disease states	GI upset Headache Skin rash May interact with blood clotting	Not enough research to recommended at this time for healthy people
Ginseng	Improved endurance capacity, energy and mood booster, Aphrodisiac, anti-stress management	Asian research supports, American research does not support	Sleeplessness, hypertension, nervousness, acne, edema, headache, diarrhea may interact with	Although Asian research supports use of Ginseng, results have not been duplicated, too many forms available and it is not known which one if effective, use is not recommended

			other drugs	
Branched Chain Amino Acids	Delay onset of fatigue, improved mental capacity, improved aerobic performance, increased muscle mass	Some research supports use for aerobic performance and decreased muscle breakdown but no effect on increase in muscle mass	GI distress, may create amino acid imbalance	Some support for aerobic performance but more research needed, carbohydrates loading is still more effective for aerobic performance
Pyruvate	Weight loss, improved exercise endurance, lowered cholesterol	One study in obese people supports weight loss, no improvements in cholesterol levels or exercise endurance	None reported	Supplement is expensive and support for product is very weak. Use is not recommended
Ephedrine (Ma Huang)	Weight loss, increased mental capacity, increased physical power	No improvements in sports performance, some evidence for weight loss in obese people	Chest pain, heart attack, stroke, increased blood pressure, seizures, psychosis, tremors, nervousness, **death**	Substance is extremely detrimental to health, use is ***NOT RECOMMENDED***
Creatine	Increase power, increase speed, increase muscle mass	Research supports use for repetitive, high-intensity, short term exercise with brief recovery periods	Weight gain, muscle cramps, kidney and liver damage	Use may be helpful in training situations for sprinting activities and weight lifting, adverse effects seem minimal but there is concern for long-term use and kidney and liver damage
Androstenedione Androstenediol	Increased strength & muscle mass, improved exercise recovery, increased sexual arousal	Very little research,, nothing to support enhanced	Decreased HDL cholesterol, emotional outbursts, acne, hair loss,	Andro has many of the same side effects as steroids, it increases risk of heart disease. **Military personnel that are taking Andro can test**

		recovery, increased muscle or increased libido	reduction in testes size, cancerous growth in prostate, elevation in blood lipid levels	**positive for steroids! Use is not recommended.**
HMB	Increased muscle mass, decreased body fat, improved recovery time	Some support for claims in animal and human studies	None noted	HMB is very new and little research has been done, no adverse effects are known. Use is not recommended because not enough research
Echinacea	Boosts the immune system, protects against common cold	Animal studies support but human studies are conflicting	None noted	Preliminary research suggests that Echinacea may be helpful to prevent common cold. More research is needed. Supplementation may be helpful.

In addition to the facts that there are a limited amount of research studies conducted on supplements, they may not be safe or effective, and they practice poor manufacturing techniques, supplements are also costly. For instance one dose of creatine costs approximately $3.50. One dose of a protein supplements costs $2.67. That means over one year a 50g dose of a protein supplement will cost the consumer approximately $2000. Two thousand dollars is a lot of money to be spent on a supplement that is probably not necessary. When it comes to supplements in most instances the consumer would be better off saving their money.

Evaluating Supplement Claims

There are many supplements out there and it is important to protect yourself against substances that may be harmful. The FDA describes health fraud as "Articles of unproven effectiveness that are promoted to improve health, well-being, or appearance." Due to the immense number of supplement products and DSHEA, the regulation of health fraud by the FDA depends on whether a fraudulent product poses a direct or indirect risk of injury. Therefore it is essential that the consumer be able to evaluate claims appearing on supplement products. To evaluate a supplement product, ask yourself the following questions:

- Where is the information about this product coming from?
  - ✓ Scientific journal/University/Hospital
  - ✓ Magazine, newspaper, pamphlet, radio, television, internet, book
  - ✓ Company selling product
- Who is telling you the information?
  - ✓ A professor in the field or a person with a degree (BS, MS, PhD)
  - ✓ A professional with appropriate credentials (R.D., P.T.)

- ✓ Salesman
- ✓ Not sure, article does not state

The information has more merit if it is coming from a scientific journal, university, or hospital. Some information in popular media like magazines and newspapers is helpful but sometimes misleading or incorrect. You should also look for the author of the article. A degreed and certified professional in the area of nutrition or fitness is the usually the best source of information. You should use caution when listening to a salesman.

The next part of the process is a critical analysis of the material. Ask yourself the following questions:

- Does the article sound to good to be true?
- If a research study is cited, is it done on a diseased population, coach potatoes, or animals?
- Does the information make conclusive statements such as: This supplement ***will*** make you lose weight?
- Does the product promise quick improvements in health, physique, or physical performance?
- Does the product claim to contain some secret or breakthrough ingredient or formula?
- Are currently popular personalities or star athletes used in its advertisements?

If the answer is yes to any of these questions, the supplement may not be safe or effective. You should take a closer look at the supplement and possibly do some further research. More information on supplements can be found through the following organizations and books:

FDA, Office of Consumer Affairs

- 1-800-FDA-4010
- www.cfsan.fda.gov/~dms/supplement.html

American Dietetic Association

- 1-800-366-1655
- www.eatright.org

Mayo Clinic Health Oasis

- www.mayohealth.org

MCCS-Semper Fit Division

The Health Professional's Guide to Popular Dietary Supplements by Allison Sarubin, MS, RD

The Ergogenics Edge by Melvin H. Williams, PhD

If you are taking any supplements and have an adverse reaction to it please report it to your health care provider and to FDA MedWatch at 1-800-FDA-1088. When reporting the adverse event all names will be kept confidential. They will ask for the following information:

- Name, address, & telephone #
- Name, address of doctor providing treatment
- Description of problem
- Name of product and store where it was bought

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